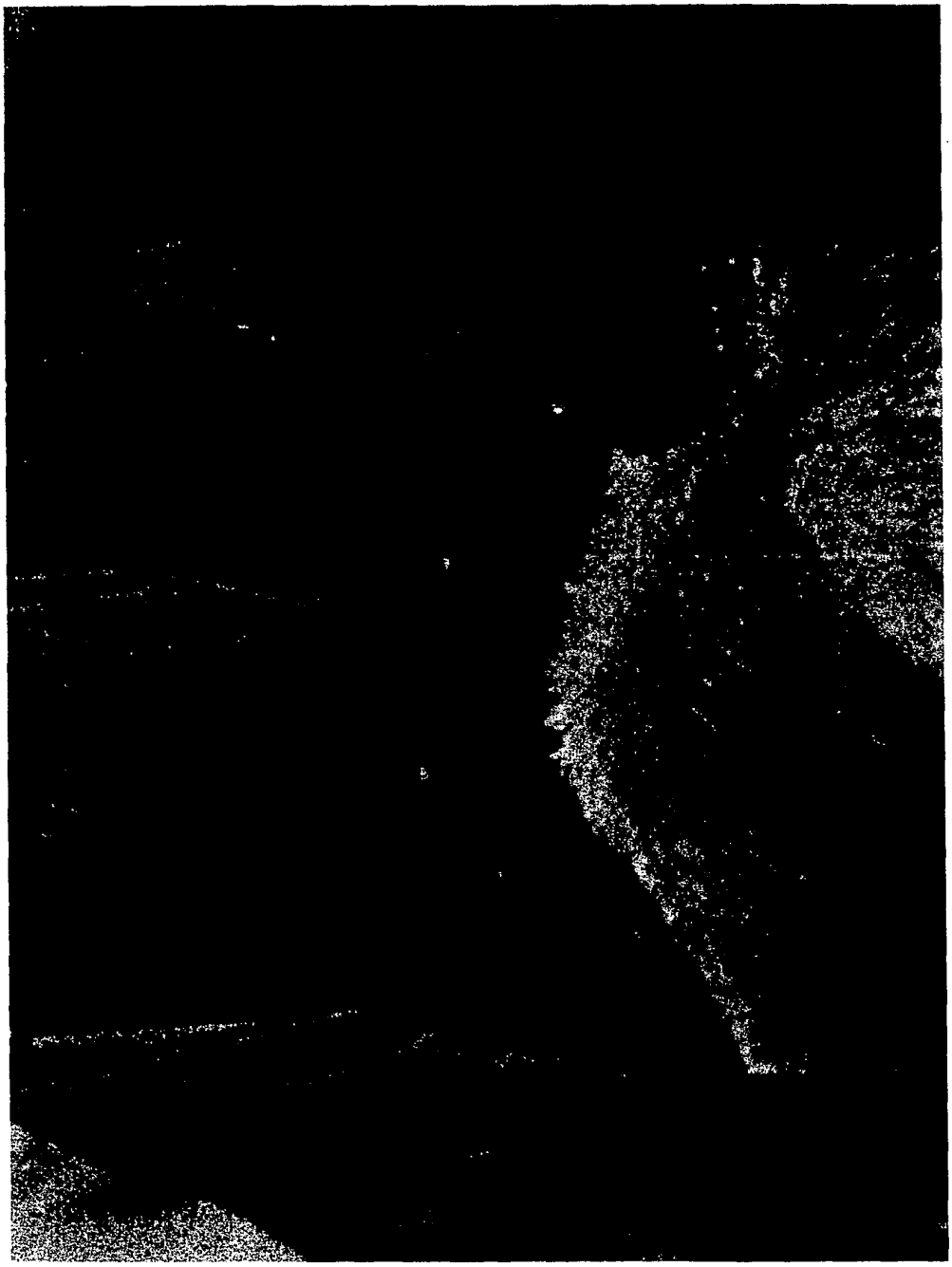

FIG. 1A

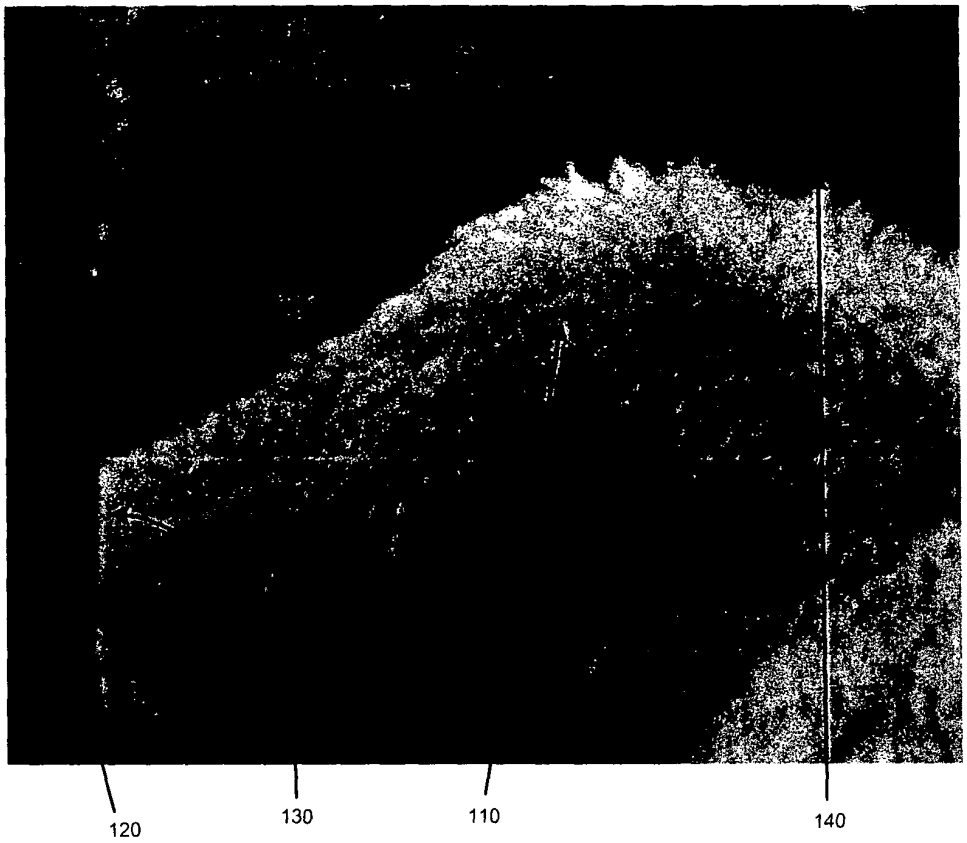

FIG. 1B

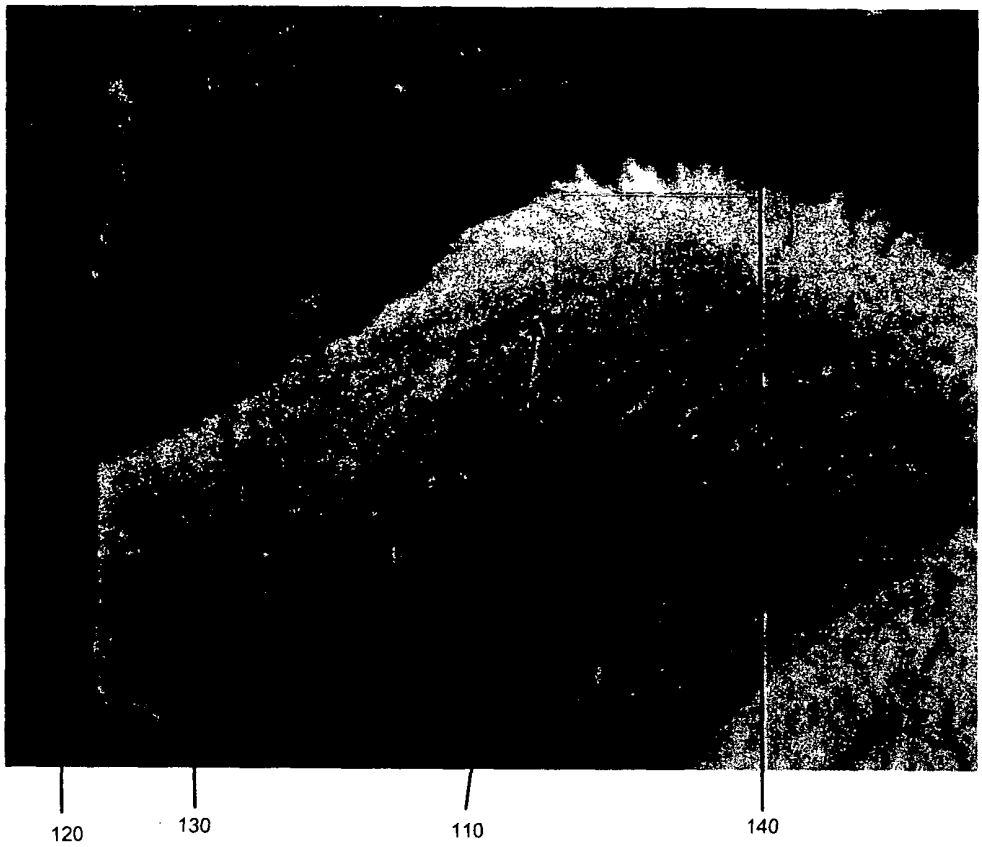

FIG. 2

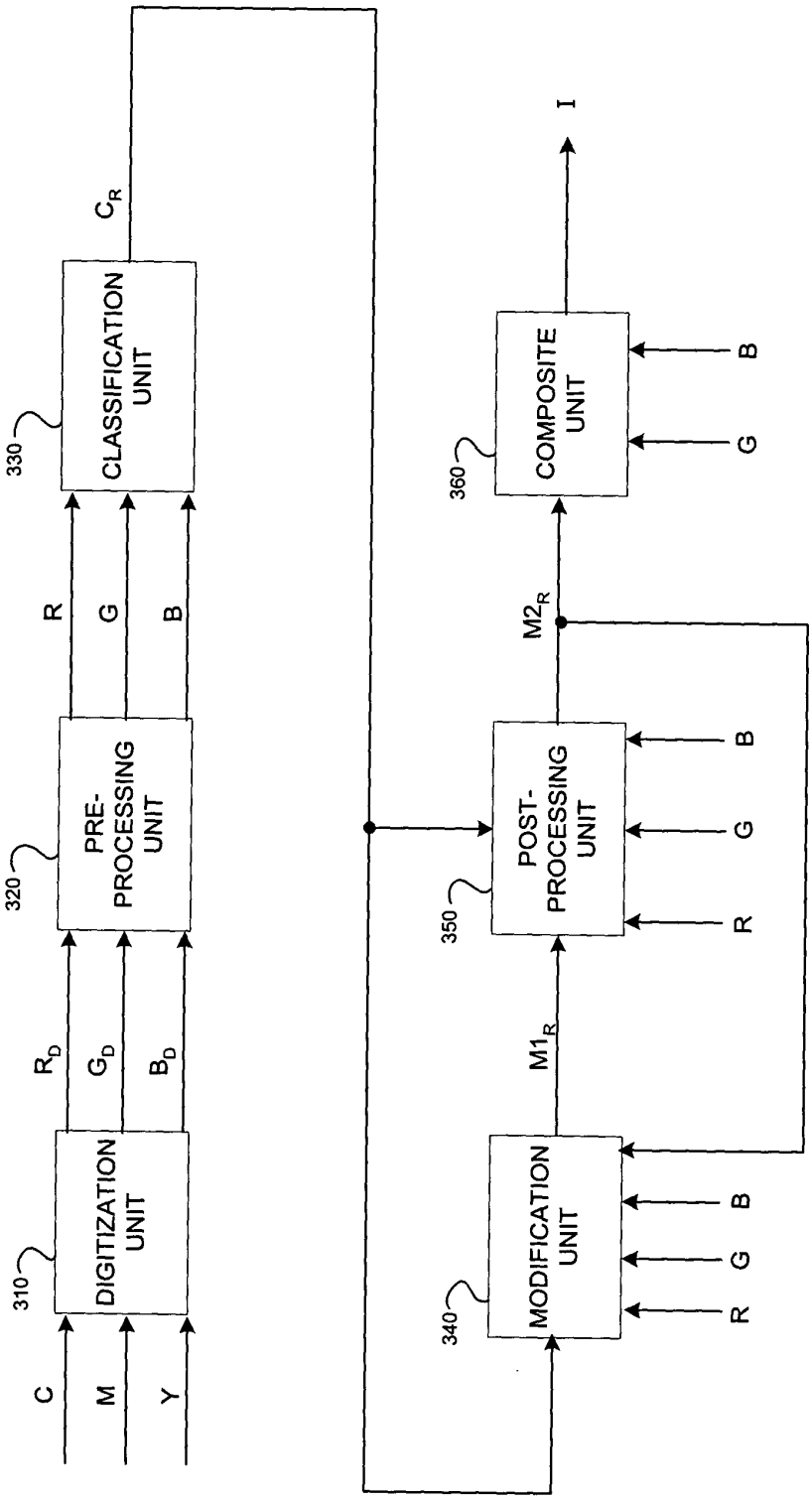
C
M
Y
310
DIGITIZATION UNIT
R_D
G_D
B_D
320
PRE-PROCESSING UNIT
R
G
B
330
CLASSIFICATION UNIT
C_R
$M1_R$
340
MODIFICATION UNIT
R G B
350
POST-PROCESSING UNIT
R G B
$M2_R$
360
COMPOSITE UNIT
G B
I

FIG. 3

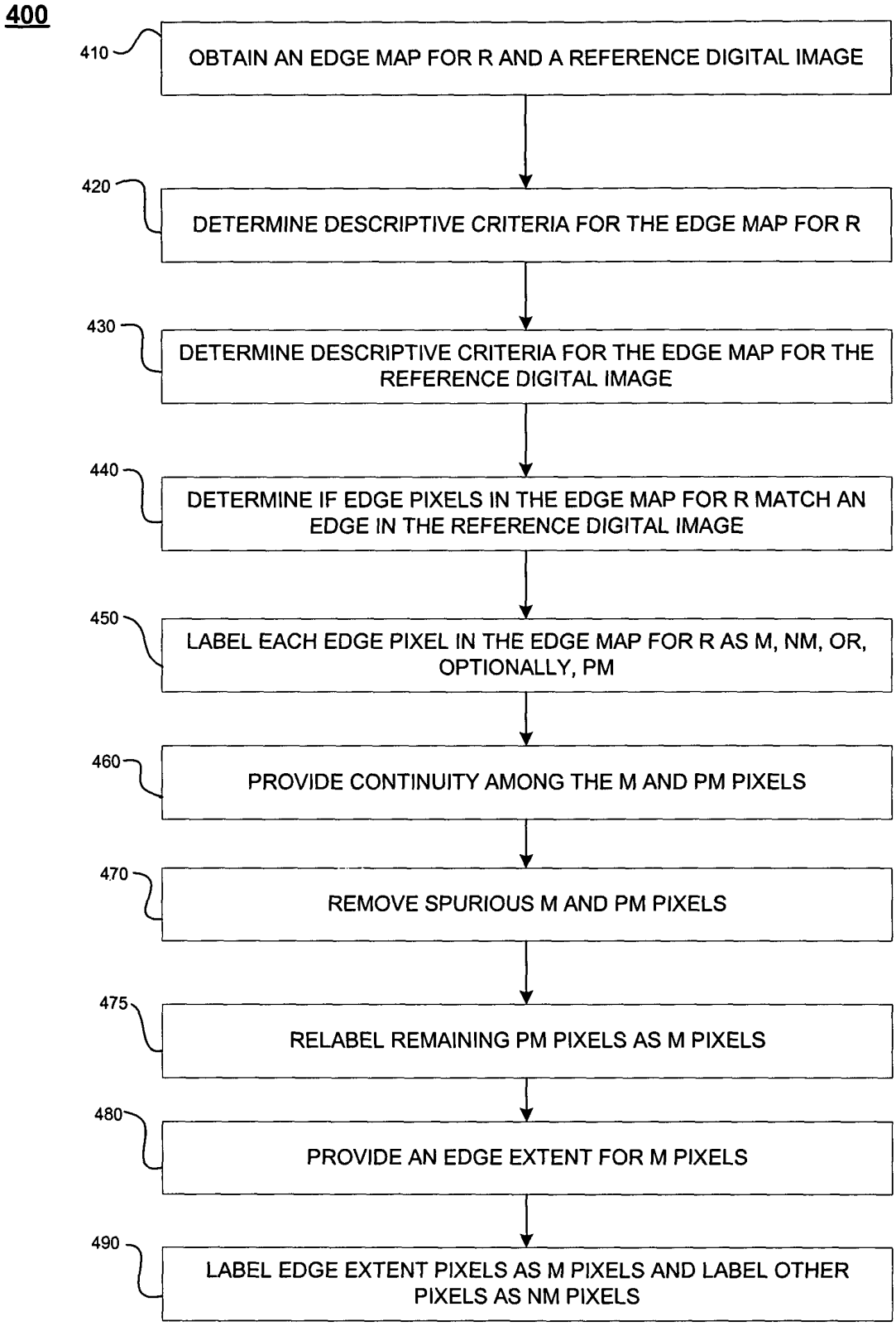
400
410
OBTAIN AN EDGE MAP FOR R AND A REFERENCE DIGITAL IMAGE
420
DETERMINE DESCRIPTIVE CRITERIA FOR THE EDGE MAP FOR R
430
DETERMINE DESCRIPTIVE CRITERIA FOR THE EDGE MAP FOR THE REFERENCE DIGITAL IMAGE
440
DETERMINE IF EDGE PIXELS IN THE EDGE MAP FOR R MATCH AN EDGE IN THE REFERENCE DIGITAL IMAGE
450
LABEL EACH EDGE PIXEL IN THE EDGE MAP FOR R AS M, NM, OR, OPTIONALLY, PM
460
PROVIDE CONTINUITY AMONG THE M AND PM PIXELS
470
REMOVE SPURIOUS M AND PM PIXELS
475
RELABEL REMAINING PM PIXELS AS M PIXELS
480
PROVIDE AN EDGE EXTENT FOR M PIXELS
490
LABEL EDGE EXTENT PIXELS AS M PIXELS AND LABEL OTHER PIXELS AS NM PIXELS

FIG. 4

500

	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

FIG. 5

600

	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

FIG. 6

700

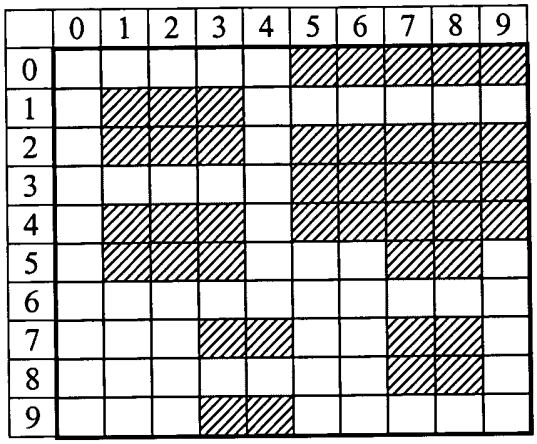

FIG. 7

800

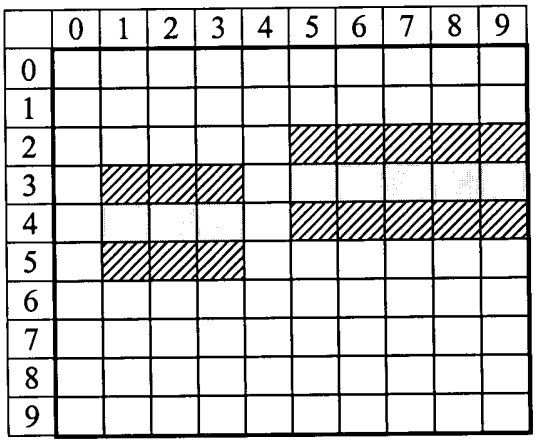

FIG. 8

900

	0	1	2	3	4	5	6	7	8	9
0										
1						M	M	M	M	PM
2										
3		M	M	M						
4										
5										
6								PM	PM	
7										
8				NM	NM					
9										

FIG. 9

1000

	0	1	2	3	4	5	6	7	8	9
0										
1						M	M	M	M	PM
2					M					
3		M	M	M						
4										
5										
6								PM	PM	
7										
8										
9										

FIG. 10

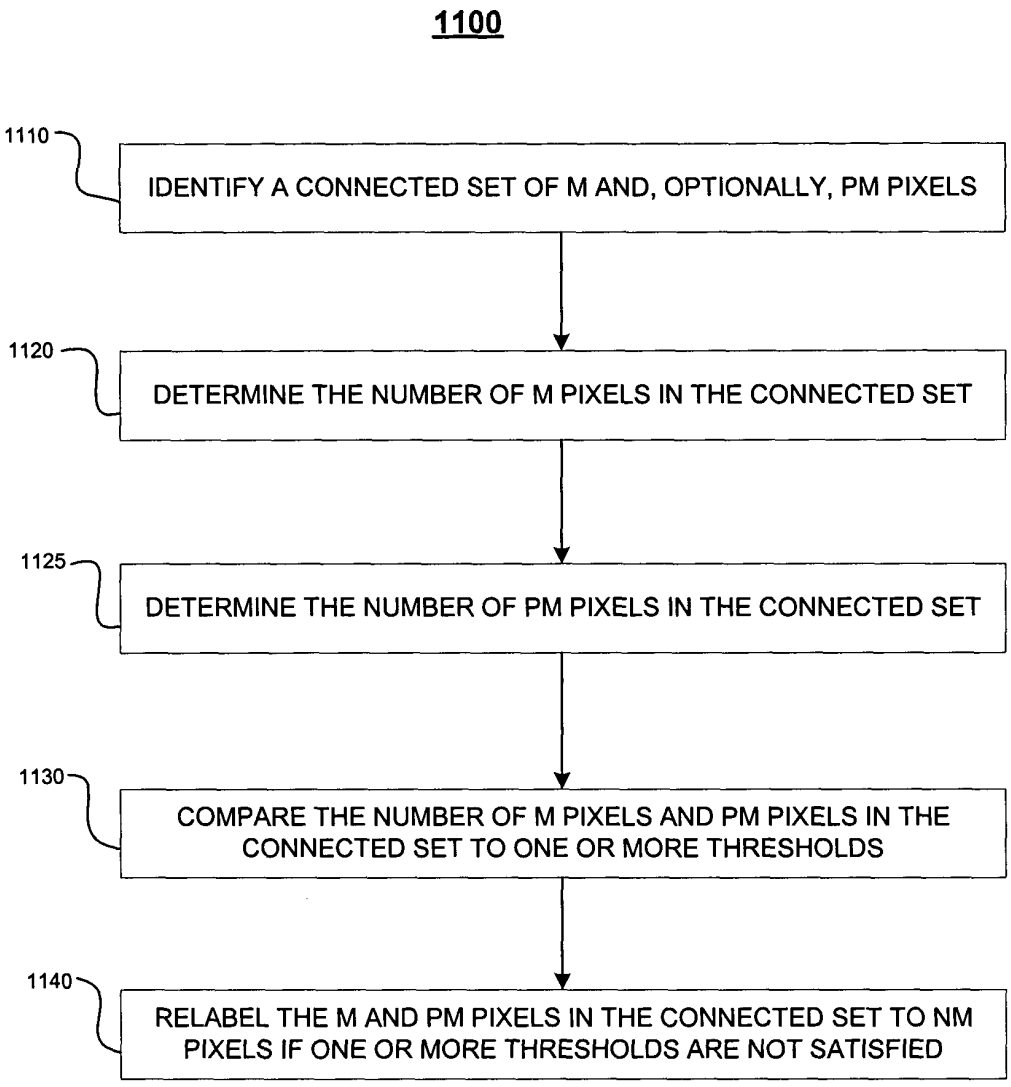
1100
1110
IDENTIFY A CONNECTED SET OF M AND, OPTIONALLY, PM PIXELS
1120
DETERMINE THE NUMBER OF M PIXELS IN THE CONNECTED SET
1125
DETERMINE THE NUMBER OF PM PIXELS IN THE CONNECTED SET
1130
COMPARE THE NUMBER OF M PIXELS AND PM PIXELS IN THE CONNECTED SET TO ONE OR MORE THRESHOLDS
1140
RELABEL THE M AND PM PIXELS IN THE CONNECTED SET TO NM PIXELS IF ONE OR MORE THRESHOLDS ARE NOT SATISFIED

FIG. 11

1200

	0	1	2	3	4	5	6	7	8	9
0										
1						M	M	M	M	PM
2					M					
3		M	M	M						
4										
5										
6										
7										
8										
9										

FIG. 12

1300

	0	1	2	3	4	5	6	7	8	9
0						M	M	M	M	M
1					M	M	M	M	M	M
2		M	M	M	M	M	M	M	M	M
3		M	M	M	M	M	M	M	M	M
4		M	M	M	M	M	M	M	M	M
5		M	M	M	M					
6		M	M	M						
7										
8										
9										

FIG. 13

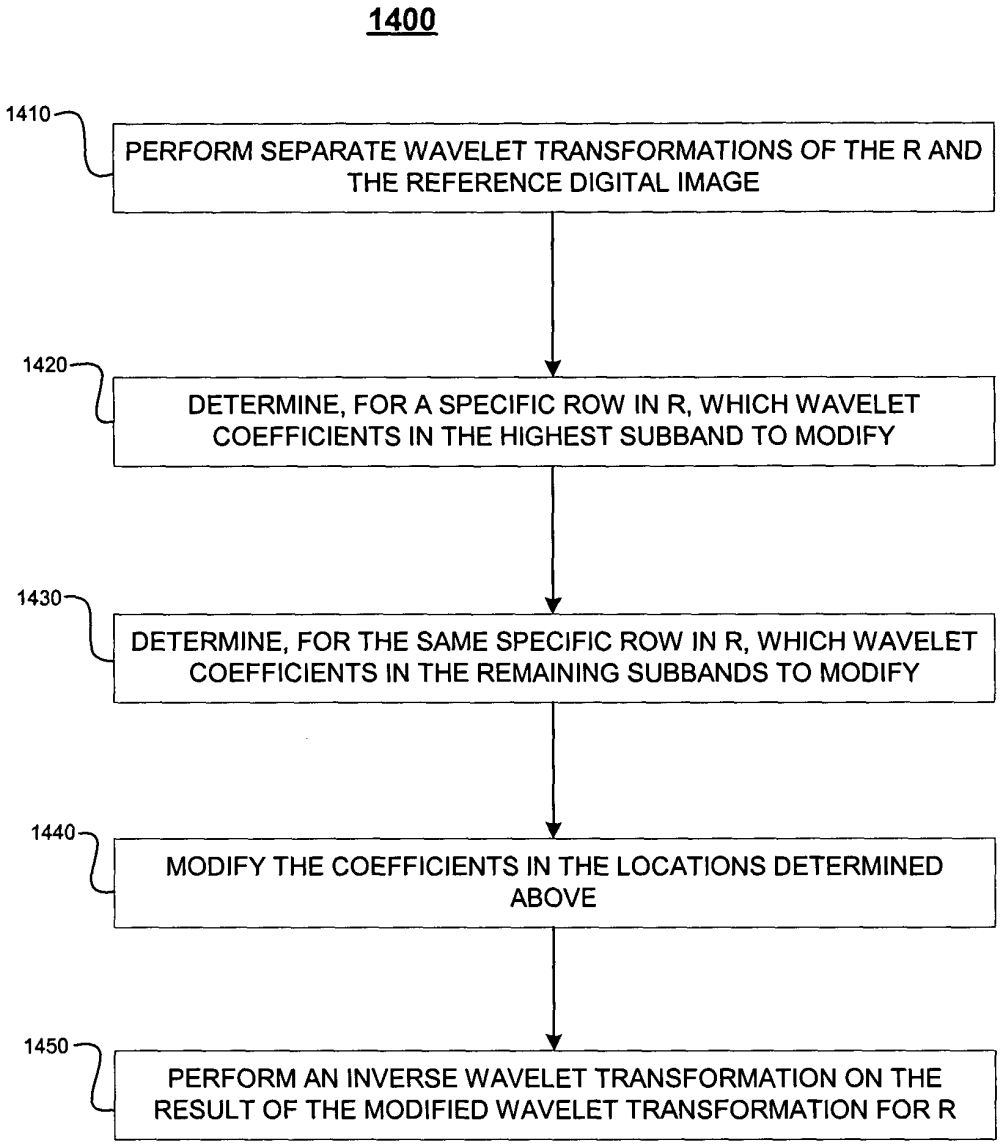
1400
1410
PERFORM SEPARATE WAVELET TRANSFORMATIONS OF THE R AND THE REFERENCE DIGITAL IMAGE
1420
DETERMINE, FOR A SPECIFIC ROW IN R, WHICH WAVELET COEFFICIENTS IN THE HIGHEST SUBBAND TO MODIFY
1430
DETERMINE, FOR THE SAME SPECIFIC ROW IN R, WHICH WAVELET COEFFICIENTS IN THE REMAINING SUBBANDS TO MODIFY
1440
MODIFY THE COEFFICIENTS IN THE LOCATIONS DETERMINED ABOVE
1450
PERFORM AN INVERSE WAVELET TRANSFORMATION ON THE RESULT OF THE MODIFIED WAVELET TRANSFORMATION FOR R

FIG. 14

1500

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Row x		M	M	M	M	M	M			M						
Subband 4	0		1		2		3		4		5		6		7	
Subband 3	0				1				2				3			
Subband 2	0								1							
Subband 1	0															
Subband 0	0															

FIG. 15

1800

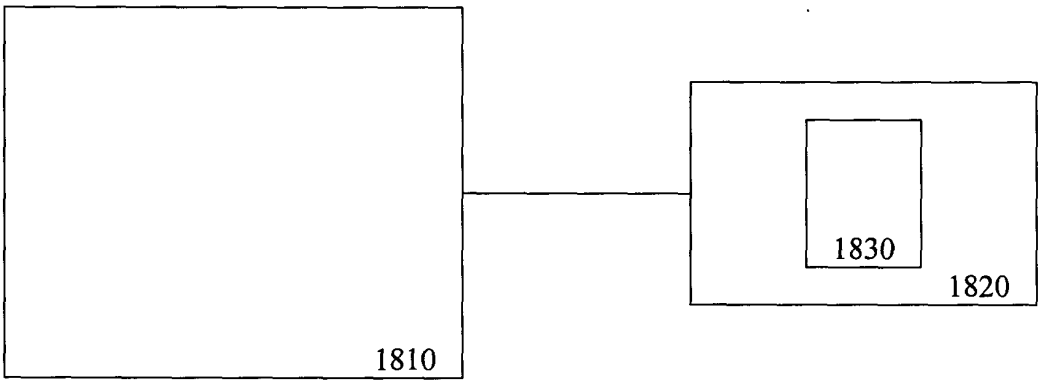

FIG. 18

1600

Column i

	Type	$M1_R$	R	G	B
j	NM	130	130	130	120
j+1	M	90	128	127	118
j+2	M	95	125	130	116
j+3	M	97	118	129	117
j+4	NM	115	115	128	120

FIG. 16

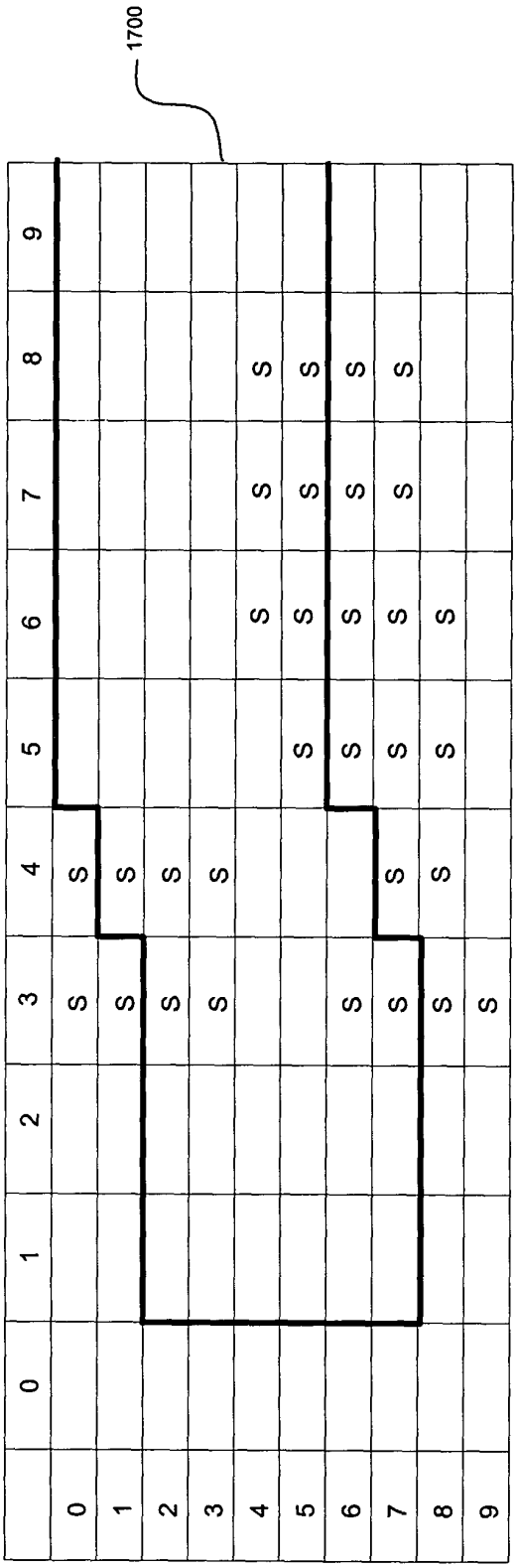

FIG. 17